AMENDMENT TO

the

ENVIRONMENTAL ASSESSMENT –

BIRD DAMAGE MANAGEMENT

IN THE

KENTUCKY WILDLIFE SERVICES

PROGRAM

USDA
Animal and Plant Health Inspection Service
Wildlife Services (WS)

January 2003

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ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
BDM	Bird Damage Management
BBS	Breeding Bird Survey
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FY	Fiscal Year
GPRA	Government Performance Results Act of 1993
IWDM	Integrated Wildlife Damage Management
KAR	Kentucky Administrative Regulations
KDA	Kentucky Department of Agriculture
MIS	Management Information System
NWRC	National Wildlife Research Center
T&E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Services
KDFWR	Kentucky Department of Fish And Wildlife Resources
WS	Wildlife Services

NOTE: On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this Environmental Assessment.

1.0 INTRODUCTION

An environmental assessment (EA) was prepared by the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) in 2000 to evaluate and support a decision regarding the location, timing, and methods of WS bird damage management (BDM) that may be conducted pursuant to requests for such service on public and private lands in Kentucky. The Decision and Finding of No Significant Impact (FONSI) issued December 7, 2000, allows WS to conduct BDM in response to bird-caused damage to agriculture, human health and safety, natural resources, and property. The EA was tiered to the WS programmatic Environmental Impact Statement (EIS)(USDA 1997).

The EA evaluated the need for WS BDM activities and the relative effectiveness of four alternatives to meet that need, while accounting for the potential environmental effects of these activities. Copies of the EA and FONSI are available for review from the Louisville KY District Office at: USDA, WS, 3231 Ruckriegel Parkway, Suite 107, Louisville, KY, 40299. Copies of the EIS are available from the USDA, APHIS-WS Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

Since that time, WS has determined the need to analyze potential impacts on several target bird species, based upon an increase in requests for WS BDM assistance. WS has decided to prepare an amendment to the EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts.

This amendment includes an evaluation to determine if impacts with regard to alternatives and issues analyzed in the EA remained within parameters described. In this document, WS compiled and reviewed information on BDM activities conducted during FY 2000-01. That information is provided in Chapter 5. Tables 1 and 2 of that Chapter show the number of birds killed by WS during BDM activities in Kentucky during FY 2000-01. Chapter 6 briefly analyzes potential effects and potential cumulative impacts related to changed aspects of the FY 2000-01 BDM program in Kentucky.

1.1 WS Legislative Authority

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary, statutory authority for the Wildlife Services program is the Act of 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), as amended in the Fiscal Year 2001 Agriculture Appropriations Bill (Public Law 106-387, Oct. 28, 2000. 114 Stat. 1549 (Sec 767)) which provides that:

> *" The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."*

Since 1931, with the changes in societal values, WS policies and programs place greater emphasis on the part of the Act discussing "bringing (damage) under control," rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

> *"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

2.0 PROPOSED ACTION

WS is proposing to continue operations under a program to manage damage caused by birds in the state of Kentucky. The proposed action remains as described in the EA.

3.0 ISSUES ADDRESSED

The issues identified and described in the EA have not changed and remain valid.

The following issues were analyzed in detail in the EA:

- Effects on Wildlife Including Target and Non-target Species and T&E Species
- Effects on Human Health and Safety
- Effects on Socio-economics of The Human Environment
- Effects on Wetlands

In addition to the identified major issues considered in detail, eleven other issues were considered, but not in detail.

4.0 ALTERNATIVES ADDRESSED

The alternatives identified and described in the EA have not changed and remain valid.

The following alternatives were analyzed in detail in the EA:

- Alternative 1 - Continue the Current Federal BDM Program. (Proposed Action/No Action)
- Alternative 2 - Nonlethal BDM Only By WS
- Alternative 3 - Technical Assistance Only
- Alternative 4 - No Federal WS BDM

In addition 4 other alternatives were considered, but not in detail.

5.0 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

Program activities and methods and their potential effects were the same for issues 2, 3, and 4 above in Fiscal Years (FY) 2000-01 as those analyzed in the EA and thus do not require any additional review or analysis. Program activities and methods and their potential effects on the eleven other issues not discussed in detail in the EA were also the same in FY 2000-01 and do not require any additional review or analysis.

To determine if impacts with regard to Issue 1 shown above have remained within parameters described in the EA, WS compiled and reviewed information on BDM activities conducted during FY 2000 and 2001. That information and its analysis are provided in this chapter.

5.1 ANALYSIS OF EFFECTS ON WILDLIFE, INCLUDING TARGET AND NON-TARGET SPECIES AND T&E SPECIES

Alternatives 2, 3, and 4

Potential impacts of Alternatives 2, 3 and 4 on wildlife have not changed from those described in the EA and thus do not require additional analysis.

Alternative 1. Continue the Current Federal BDM Program. (Proposed Action/No Action Alternative)
The following paragraphs present information and an analysis of effects on species killed in WS BDM programs in Kentucky during FY 2000-01.. Tables 1 and 2 list all birds taken by WS during those two years, respectively. Table 5-1 from the EA lists birds killed by WS BDM programs during Fiscal Years 1997-99. It is reproduced in Appendix A for the purpose of comparison with take for the two years presented in Tables 1 and 2 of this amendment.

5.1.1 Target Bird Species

The EA discussed (Chapter 5, Environmental Consequences) expected take of various bird species in BDM programs in Kentucky and the expected effects on those species. Tables 1 and 2 (FY 2000-01), and Appendix A (FY1997-99) list the number of individual birds killed by WS under Depredation Orders, MBTA permits issued to WS, and MBTA permits issued to WS cooperators. Outcomes of the FY 2000-01 BDM programs did not differ from expected results for those species analyzed in the EA, except mourning doves and vultures. In addition, damage management objectives of the program required the take of other species, including American robins, not analyzed in the EA. Some other species, listed in Tables 1 and 2, were killed in very small numbers during the FY 2000-01 programs, but were analyzed in Subsection 5.1.1 of the EA (Other Target Species), which referenced Subsection 1.2 of the EA for a bird group/species list. Still others, not specifically addressed in the EA were taken in the course of BDM activities, almost exclusively related to safety threats to air passengers, and damage threats to aircraft at airports. These additional species were taken in exceedingly small numbers (less than 10 of each species group). Therefore, this report will analyze potential effects related to the level of take for mourning doves, vulture species, American robins, and for those additional species among which individuals were killed during FY 2000-01program activities. In addition, potential effects of WS BDM programs on purple martins are also analyzed in this document because of actual damage being caused, and special damage threats being presented, by them in Kentucky.

Table 1. Birds Killed By WS Through All Methods, And Eggs Destroyed, In Kentucky For Bird Damage Management In FY 2000.

Species	Damage Management Methods										
	Alpha Chlor a-lose	DRC-1339	Avitrol	Raptor Trap	Cage Trap	Shoot-ing	Harass-ment / Shootin g	Spotlight / shooting	Multiple Harassmen t Methods	Hand Caught	Eggs Destroy-ed
Mixed-species blackbirds		1,400				8					
Red-winged blackbirds				15							
B-H Cowbirds						7	100				
American Crows		960		1		4	5				
Mourning Doves					122	200	957			2	
Dabbling Ducks						3	2				
Other Falcons						2	1				
Canada Geese	1A					21	36				
Feral Geese	2A										
Common Grackles						2					
Cooper's Hawks				1			1				
Harrier Hawks						2					
Other Hawks						3					
Red-tailed Hawks				20		7	4				
Great Blue Herons						1					
American Kestrels				27			17				
Killdeer						72	23				
Horned Larks						2					
Mallards	1A					14	45				5
E. Meadowlarks						17	9				
N. Mockingbirds						7					
Great-Horned Owls				9							
Other Owls						1					
Feral Pigeons		4,125			1,577	835		776			
A. Robin					2	19	60				
H/E Sparrows			153		8	211				2	
E. Starlings		45,124				20,541	962		10	8	
Barn Swallows							12				
Black Vultures						30	8				
Mixed Vultures						3	17				
Turkey Vultures						9					
TOTAL BIRDS KILLED BY METHOD	4	51,609	153	73	1,709	22,021	2,259	776	10	12	5

A. Birds reported as killed were due to accidental mortalities or euthanasia because of injury, or associated with live-capture by alpha-chloralose.
B. Other Unintentional Take
C. Non-target Take

Table 2. Birds Killed By WS Through All Methods, And Eggs Destroyed, In Kentucky For Bird Damage Management In FY 2001.

Species	Damage Management Methods										
	Alpha Chlora-lose[1]	DRC-1339	Avitrol	Raptor Trap	Cage Trap	Shoot-ing	Harassment / Shooting	Spotlight / shooting	Multiple Harass-ment Methods	Hand Caught	Eggs Destroyed
Mixed-species blackbirds		985				8					
Red-winged blackbirds				1		114	5				
B-H Cowbirds						1					
American Crows		718		1B		6	53				
Mourning Doves					66	313	1764				
Canada Geese	3A					12	11				
RgB Gulls							26				
B-C Night Herons											17
Great Blue Herons						3	1				
G-backed Herons						2					
Other Hawks				3		5					
Red-tailed Hawks				42		20	2				
American Kestrels				25			14				
Cooper's Hawks				4							
Killdeer						44	8				
Mallards						33	22				5
E. Meadowlarks						33	3				
N. Mockingbirds						4					
Great-.Horned Owls				19							
Feral Pigeons		1783			1340	1153	21	582			
A. Robin						61	76				
H/E Sparrows			74			44	50				
E. Starlings		23,715	1,001		83	573	1,043			8	
Barn Swallows						4					
Wild Turkeys						3	2				
Black Vultures					47	9	58				
Turkey Vultures				1		8	110				
TOTAL BIRDS KILLED BY METHOD	3	27,201	1,075	96	1,536	2,453	3,269	582	0	8	22

A. Birds reported as killed were due to accidental mortalities or euthanasia because of injury, or associated with live-capture by alpha-chloralose.
B. Other Unintentional Take
C. Non-target Take

5.1.1.1 Mourning Dove Population Effects

Mourning doves are migratory game birds with substantial populations throughout much of North America. Many States in the U. S. have regulated annual hunting seasons for the species and take is liberal. Kentucky allows a hunting season each year, with generous bag limits for mourning doves. BBS data indicates that mourning dove population trends have been decreasing slightly annually (- .32%) in the U.S., but rising (.42%) annually in the Eastern BBS Region, and Kentucky (.37%) from 1966-00. During 1998-00 the trend estimate had an annual increase of 2.79%, 3.11%, and 16.28% respectively for the U.S., the Eastern BBS Region, and Kentucky, (Saur et al., 2001) suggesting that there may have been a considerable increase in statewide populations in the past few years. While such short term population trend estimates do not necessarily indicate a changed population trend status, or population health status (R. Pritchert, KDFWR, Pers. Comm. 2002), it may have local or regional implications for temporary and time-framed damage management needs (R. Dolbeer, WS, Pers. Comm., 2002).

Mourning doves have become common inhabitants of urban environments in Kentucky, even nesting frequently in man-made structures (R. Myers, WS Pers. Comm, 2002). This species is the most abundant dove in North America, is the champion of multiple brooding in its range, and is expanding northward (Ehrlich et al, 1988).

In Kentucky, WS killed an average of 1,715 mourning doves per year during FY 2000-01. Most of these birds were taken in programs to protect human safety at airports. This number was higher than the average for FY 1997-99 which was 606 birds/year, as discussed in the EA. Analysis of program activities related to the change in numbers of birds killed, and to mourning doves population trends over time revealed that:

- WS personnel observed greater concentrations of mourning doves at airports where assistance was provided during FY 2000-01 than in previous years ([redacted], WS, Pers. Comm. 2002). In addition, despite WS and airport management coordination of legal hunts and habitat management strategies to reduce the attractiveness of sites at some airports, for the purpose of reducing use of sites by mourning doves, the take of increased numbers of this species by WS field personnel was still necessary at several locations to reduce damage threats.

- Comparisons of mourning dove damage management activities for the two periods revealed that during FY 1997-99 program activities addressed an average of 4,096 mourning doves annually, while during FY 2000-01 an average of 13,548 doves was addressed annually. Most of these birds (87%)were dispersed in non-lethal harassment actions in projects to protect human safety at airports.

- BBS population trend data revealed that between 1966-2000 mourning dove populations demonstrated an annual increase in the Eastern BBS Region and in Kentucky. In addition, this annual increase was noted nationally during 1998-00 and was somewhat larger in the Eastern BBS Region and in Kentucky.

It is likely that increasing numbers of mourning doves, at least in urban environments, has resulted in elevated levels of damage and damage threats, and WS actions have likewise increased in response to need for more intensive damage management.

Hunters in Kentucky have taken .75 - 1 million mourning doves each year for the past few years, in legal hunts (R. Pritchert, KDFWR, Pers. Comm. 2002). As indicated, mourning dove populations have continued to increase in Kentucky and the region, and this level of take appears to be a sustainable harvest level in the State for the species. WS may take as many as 3,500 mourning doves in all projects in Kentucky in any given year in the future. This level of take is fairly insignificant to the number of this species killed by hunters, and should have no effect on overall regional, state, or national populations of the species. USFWS and KDFWR concur with WS conclusions (C. Hunter USFWS and R. Pritchert, KDFWR, Pers. Comm. 2002).

5.1.1.2 Vulture Population Effects

The turkey vulture is one of three species of vultures found in North America and is the most common and widespread of the New World vultures. This species nests throughout all of the United States except northern New England. They are conspicuous for their soaring behavior as they search for carcasses, locating them primarily by aid of the sense of smell. They possess weak feet and blunt claws instead of sharp talons like hawks and owls. Their heads are bare, which assists them in preventing their feathers from becoming fouled by carrion. They nest in tree cavities or on the ground. Turkey vultures are valuable for their removal of garbage and disease -causing carrion. At night they often gather in large roosts (National Audubon Society, 2000). BBS population trend data indicates that the turkey vulture has experienced an annual increase in the U. S. as a whole (1.26%), in the Eastern BBS Region (3.41%) and in Kentucky (0.91%) from 1966-2000 (Sauer et al., 2001). During 1998-00, an annual increase is also noted for the U.S. (1.61%), but an annual decrease is recorded for the Eastern BBS Region (-0.22%) and Kentucky (-3.87%).

Black vultures are scavengers that feed on carrion, but they also take weak, sick, or unprotected young birds and mammals. They are smaller but more aggressive than turkey vultures and will drive the latter from a carcass. Both species are often found perched in trees, on fence posts, and on the ground, or flying high overhead, especially on windy days, taking advantage of thermals or updrafts. Unlike turkey vultures, black vultures depend on their vision to find food. This species is more or less resident from Texas and Arkansas, north and east to New Jersey, and south to Florida and are rarely found as far north and east as Massachusetts and Maine (National Audubon Society, 2000).

BBS trend data reveals an annual increase for black vultures in the U.S. (2.96%), the eastern BBS region (2.21%) and Kentucky (34.22%) from 1966 through 2000 (Sauer et al., 2001). Trends during 1998-00 indicate an annual increase of 9.30% for the U.S., 10.42% for the Eastern BBS Region, and 41.70% for Kentucky. While such short term population trend estimates do not necessarily indicate a changed population trend status, or population health status (R. Pritchert, KDFWR, Pers. Comm. 2002), it may have local or regional implications for temporary and time-framed damage management needs (R. Dolbeer, WS, Pers. Comm. 2002). This species appears to exhibit healthy and burgeoning populations in most of its range and has been reported to cause damage in several locations in the southeast (B. Constantin and K. Garner WS, 1999, Lowney 1999, R. Myers, and [redacted] WS, 2002 Pers. Comm.).

WS receives requests to address damage caused by both turkey and black vultures in Kentucky. Sometimes these two species are found causing damage at the same site and congregating in mixed flocks. During FY 2000-01 WS killed 300 (annual average = 150) vultures in all BDM activities. Most of these birds were killed in association with harassment shooting to reinforce noise harassment as part of vulture dispersal activities related to protection of human health and other sanitation concerns. This number exceeded the annual average of birds taken during 1997-99 (27/year). Analysis of program activities related to the change in numbers of birds killed, and to population trends related to vultures revealed that:

- WS received 10% more calls for assistance with vulture damage during FY 2000-01 than during FY 1997-99. Damage values reported to WS, related to vultures, also increased an average of approximately $10,000 per year during FY 2000-01 when compared to FY 1997-99 (USDA-WS MIS Database).

- Comparisons of vulture damage management activities for the two periods revealed that during FY 1997-99 program activities addressed an average of 586 vultures annually, while during FY2000-01 an average of 816 vultures was addressed annually. Most of these birds (82%)were dispersed in non-lethal harassment actions in various projects to protect property and human health or safety.

- BBS population trend data revealed that between 1966-2000 an annual increase for both species of vultures nationally, and an annual increase for black vultures in the Eastern BBS Region, and in Kentucky between 1998-2000. While such short term population trend estimates do not necessarily indicate a changed population trend status, or population health status (R. Pritchert, KDFWR, Pers. Comm., 2002), it may have local or regional implications for temporary and time-framed damage management needs (R. Dolbeer, WS, Pers. Comm. 2002).

Increasing requests for assistance in managing vulture damage and increasing numbers of birds at damage sites will probably require an increased level of take by WS in future programs in Kentucky. WS is evaluating innovative non-lethal methods in Kentucky, including the use of vulture effigies, to address increasing vulture damage in the State. However, it is possible that WS could kill as many as 400 vultures each year in BDM programs. No negative effects are expected to occur related to populations of these species in the Eastern BBS Region, or in Kentucky, as a result of such BDM programs. USFWS and KDFWR concur with WS conclusions (C. Hunter USFWS and R. Pritchert, KDFWR, 2002).

5.1.1.3 American Robin Population Effects

American robins have a wide range and are extremely abundant, being found in most of the United States (National Audubon Society, 2000). They are found in both urban and rural environments and in Kentucky sometimes integrate with large communal blackbird or European starling roosts in cities. Roosts with robin numbers exceeding 1,000 birds have been documented by WS (R. Myers, WS, Pers. Comm. 2002) in some Kentucky cities and are known to gather in large roosts, often containing thousands of birds (National Audubon Society, 2000). WS sometimes encounters fairly large numbers of robins roosting with mixed-species blackbirds and European starlings.

Robins pose hazards to air passengers at airports in Kentucky, and elsewhere in the United States (K. Gustad, B. Dunlap, WS, Pers. Comm. 2002). WS sometimes kills robins which pose threats to air traffic at airports in Kentucky where assistance is requested.

In Kentucky, WS killed an average of 109 American robins per year during FY 2000-01. All of these birds were taken in programs to protect human safety and most were at airports. This number was higher than the average for FY 1997-99 which was 2.3 birds/year. Analysis of program activities related to the change in numbers of American robins killed, and to population trends related to this species revealed that:

- WS personnel observed greater concentrations of American robins at airports and in urban mixed-species bird roosts, where assistance was provided during FY 2000-01 than in previous years (R. Myers, and [redacted], WS, Pers. Comm. 2002)

- Comparisons of robin damage management activities for the two periods revealed that during FY 1997-99 program activities addressed an average of 313 American robins annually, while during FY 2000-01 an average of 1740 robins were addressed annually. Most of these birds (94%)were dispersed in non-lethal harassment actions in projects to protect human safety at airports or urban environments.

- The Federal Aviation Administration bird strike database reveals that 102 strikes involving robins were reported for the U.S. from 1990-99. This was an average of 10.2 strikes involving robins per year for the period. However, during 2000-2001 there were 25 strikes involving robins. This is an average of 12.5 strikes per year, suggesting that numbers of robins being struck by aircraft had risen during 2000 - 01. Data on bird strikes at airports in Kentucky shows a comparable increase in numbers of robins struck in the State (USDOT 2002, S. Wright, NWRC, Pers. Comm. 2002). This data assumes that reporting procedures for such strikes have remained essentially unchanged during 1990-2002.

- BBS population trend data revealed that between 1966-2000 American robin population showed an annual increase for the U.S. (0.83%), the Eastern BBS Region (0.79%), and Kentucky (2.84%). This data demonstrates that population growth trends for robins in Kentucky has been higher than for the U.S. average and higher than for the Eastern BBS Region. During 1998-2000 trends in robin populations showed a slight annual decline for the U.S. (-0.34), a very slight annual increase in the Eastern BBS Region (0.03%), and an annual increase in Kentucky (1.88%). While such short term population trend estimates do not necessarily indicate a changed population trend status, or population health status (R. Pritchert, KDFWR, Pers. Comm. 2002), it may have local or regional implications for temporary and time-framed damage management needs (R. Dolbeer, WS, Pers. Comm. 2002).

It is likely that increasing numbers of American robins at airports and in mixed-species roosting flocks in Kentucky have resulted in elevated levels of damage and damage threats, and WS actions have likewise increased in response to need for more intensive damage management.

Future WS BDM programs in Kentucky may kill as many as 2,000 robins each year in all combined programs in the State. This level of take would have no effect on the overall national, regional, or statewide population of this species. USFWS and KDFWR concur with WS conclusions (C. Hunter USFWS and R. Pritchert, KDFWR, 2002).

5.1.1.4 Purple Martin Population Effects

The purple martin (*Progne subis*) is the largest North American swallow and is seen in open woodland, agricultural fields, and residential areas. They breed from British Columbia, central interior Canada, and Nova Scotia southward, but are absent from the interior western mountains and the Great Basin. They breed in open country, savanna, and rural areas, especially near water making nests out of grass, leaves, mud, feathers, and occasionally constructing a dirt rim on the nest to keep the eggs from falling out. Nests are to be seen in tree holes, cliff niches, or other cavities, but often in a birdhouse which many people erect to attract these birds (Ehrlich et. al., 1988, National Audubon Society, 2000). Purple martins may produce 1-3 broods per year. They commonly perch on wires, and are aerial feeders, but are occasionally seen on the ground feeding on insects. This species usually nests in colonies and gathers in enormous premigratory communal roosts of 100,000 (Ehrlich et. al., 1988) to one million or more (J. R. Hill, III, Purple Marten Conservation Assoc., Pers. Comm. 2002) birds at the end of summer.

WS has received a number of requests during 1998-2002 for assistance in managing damage caused by purple martins frequenting communal roosts in Kentucky. These roosts have caused sanitation concerns in residential areas, school campuses, and business locations. In addition, air traffic safety has been jeopardized by large purple martin roosts at one airport in the state. Historically, WS has provided both technical and direct control assistance to requesters for addressing such problems. Most situations have been resolved through intensive harassment / dispersal programs, but this species sometimes responds poorly to harassment methods and deriving satisfactory solutions is often delayed. Such delays further increase jeopardy to air passengers when a roost is posing air traffic hazards at an airport.

BBS population trend data indicates that the purple martin has experienced a slightly annual decline in the U. S. as a whole (- 0.19%), and in the Eastern BBS Region (- 0.58%), with an annual increase in Kentucky (4.03%) from 1966-2000 (Sauer et al., 2000). An annual increase is also noted for the U.S. (7.19%), the Eastern BBS Region (6.66%) and a large annual increase for Kentucky (41.73%) from 1998-2000. While such short term population trend estimates do not necessarily indicate a changed population trend status or population health status (R. Pritchert, KDFWR, Pers. Comm., 2002), it may have local or regional implications for temporary and time-framed damage management needs (R. Dolbeer, WS, Pers. Comm. 2002).

WS has not killed any purple martins in BDM programs in Kentucky in the past. However, as many as 10% of any flock of purple martins in the State could be killed in programs to reduce human health and safety risks. This level of take is not expected to have any effect on national, BBS Eastern Region, or State populations of this species. The USFWS concurs with WS conclusions (C. Hunter, USFWS, Pers. Comm. 2002).

5.1.2 Other Target Species Population Effects

WS BDM programs in Kentucky routinely result in killing a minimal number of passerine birds (Order Passeridae)and a few other birds among different bird groups (see Tables 2 and 3), such as the grosbeaks, buntings, and sparrows group (Family Emberizidae), larks (Family Alaudidae) and others, which were not analyzed in the EA. Numbers of these species taken in such programs should continue to be low, not exceeding 100 birds of a single species in any FY, but may include additional species not treated in the EA. Those species may include, but not be limited to: northern mockingbirds (*Mimus polyglottos*), northern cardinals (*Cardinalis cardinalis*), house finches (*Carpodacus mexicanus*), blue jays (*Cyanocitta cristata*), horned larks (*Eremophila alpestris*), and cedar waxwings (*Bombycilla cedrorum*).

The level of take in WS BDM programs, of any species contemplated among those in this Subsection, would have no effect on national, regional or statewide populations of those species.

Birds among these species, any other passerine species, birds among the families discussed previously, or among any other bird group, may be killed in any WS BDM program at any sites in Kentucky where assistance is requested. Numbers of birds taken in these programs should continue to remain low, not exceeding more than 100 individuals within a given species. Any federally listed T&E species among these species or groups would not be killed.

5.2 NON-TARGET SPECIES AND T&E SPECIES

5.2.1 Non-Target Species

The analysis of WS potential impacts on non-target species remains as described in the EA and does not require any additional review or analysis. During FY 2000-01 WS did not take any non-target bird species while conducting BDM activities in KY.

5.2.2 Threatened and Endangered Species

WS has reviewed the list of Threatened and Endangered species for Kentucky. Since the time of the analysis of potential effects on T&E species presented in the EA, 3 additional species have been added to the list for Kentucky. All new listings for the State are animals, including mammals, birds, and mussels. The new list of T&E species is presented in Table 3. This subsection presents analysis of potential impacts of the Kentucky BDM program on those new listed species.

5.2.2.1 Piping plover

Past evaluation of WS BDM programs and their potential impacts on piping plovers (USDA 1992) indicated that scaring devices used in blackbird damage control activities may adversely affect this species. The evaluation further indicated that pole trapping to manage damage being caused by owls may positively effect the species (USDA 1992). However, in the Biological Opinion (B.O.) submitted by USFWS regarding methods applications relative to a number of species determined that the piping plover would not be adversely affected by any aspect of the WS program (USDA FEIS Appendix F, 1997).

Based on an analysis of new T&E species for Kentucky, including habitat factors, methods to be employed in BDM program activities, biology, behavior and management of those listed species, and SOP's of BDM activities, WS concludes that there will be no effect on any of the remaining new listed T&E species in the State as a result of the WS BDM Program.

Table 3. T&E species that are Federally listed (or proposed for listing) for the State of Kentucky, 2002.

Mammals:

Virginia big-eared bat (*Corynorhinus townsendii virginianus*)
Gray bat (*Myotis grisescens*)
Indiana bat (*Myotis sodalis*)

Birds:

Bald eagle (*Haliaeetus leucocephalus*)
Interior least tern (*Sterna antillarum athalassos*)
Piping plover (*Charadrius melodus*)

Fish:

Relict darter (*Etheostoma chienense*)
Duskytail darter (*Etheostoma percnurum*)
Palezone shiner (*Notropis albizonatus*)
Blackside dace (*Phoxinus cumberlandensis*)
Pallid sturgeon (*Scaphirhynchus albus*)

Mussels:

Cumberland elktoe (*Alasmidonta atropurpurea*)
Fanshell (*Cyprogenia stegaria*)
Cumberlandian combshell (*Epioblasma brevidens*)
Oyster mussel (*Epioblasma capsaeformis*)
Catspaw (*Epioblasma obliquata obliquata*)
Northern riffleshell (*Epioblasma torulosa rangiana*)
Pink mucket (*Lampsilis abrupta*)
Ring pink (*Obovaria retusa*)
Little-wing pearlymussel (*Pegias fabula*)
Orange-foot pimpleback (*Plethobasus cooperianus*)
Clubshell (*Pleurobema clava*)
Rough pigtoe (*Pleurobema plenum*)
Fat pocketbook (*Potamilus capax*)
Cumberland bean (*Villosa trabalis*)
Cracking pearlymussel (*Nemistena lata*)
Dromedary pearlymussel (*Dromus dromus*)

Tan riffleshell (*Epioblasma florentina walkeri*)
Tubercled blossom (*Epioblasma torulosa torulosa*)
White wartyback *Plethobasus cicatricosus*)
Winged mapleleaf (*Quadrula fragosa*)

Crustaceans:

Kentucky cave shrimp (*Palaemonias ganteri*)

Insects:

American burying beetle (*Nicrophorus americanus*)

Plants:

Price's potato-bean (*Apios priceana*)
Braun's rock cress (*Arabis perstellata* var. *perstellata*)
Cumberland rosemary (*Conradina verticillata*)
Eggert's sunflower (*Helianthus eggertii*)
Cumberland sandwort (*Minuartia cumberlandensis*)
White-haired goldenrod (*Sloidago albopilosa*)
Short's goldenrod (*Solidago shortii*)
Virginia spiraea (*Spiraea virginiana*)
Running buffalo clover (*Trifolium stoloniferum*)

6.0 CUMULATIVE EFFECTS OF WS BDM ACTIONS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time. In the EA, WS identified and analyzed potential cumulative effects for both the chemical and non-chemical components of the Proposed Alternative (Alternative 1). Both chemical and non-chemical methods use was comparable in FY 2000-01. Analysis of cumulative impacts related to BDM programs for those years follows in these Subsections.

6.1 CUMULATIVE IMPACT POTENTIAL FROM CHEMICAL COMPONENT OF THE FY 2000-01 PROGRAM

BDM programs which include lethal population management components using pesticides may have the greatest potential for cumulative impacts on the environment as such impacts relate to deposit of chemical residues in the physical environment and environmental toxicosis. The avicide DRC-1339, and the frightening agent Avitrol, are the only two chemicals used in the Kentucky WS BDM program for the purpose of obtaining lethal effects on birds. These two chemicals have been evaluated for possible residual effects which might occur from buildup of the chemicals in soil, water, or other environmental sites. DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). In addition, the relatively small quantity of DRC-1339 used in BDM programs in Kentucky, the chemical's instability which results in speedy degradation of the product as was discussed in Subsection 5.1.3.1 and Appendix B of the EA, and the application protocol used in WS programs reduces the likelihood of any environmental accumulation. DRC-1339 is not used by any other entities in Kentucky.

DRC-1339 is the primary lethal chemical BDM method that would be used under the current program alternative. There has been some concern expressed by a few members of the public that unknown but significant risks to human health may exist from DRC-1339 used for BDM. As outlined in the EA, factors related to DRC-1339 and its use which reduce the risk of public health problems from use of this chemical are:

- The use of DRC-1339 is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (contrary to some misconceptions expressed by a few members of the public, DRC-1339 is not applied to feed materials that livestock can feed upon).

- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours, which means that treated bait material generally is nearly 100% broken down within a week.

- DRC-1339 is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people.

- Application rates are extremely low (less than 0.1 lb. of active ingredient per acre) (EPA 1995).

- A human would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.

- The EPA has concluded that, based on mutagenicity studies (the tendency to cause gene mutations in cells), this chemical is not a mutagen or a carcinogen (i.e., cancer-causing agent) (EPA 1995). Notwithstanding, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The Kentucky WS program used an average of 2,008.69 grams (70.98 ounces) of DRC-1339 per year during FY 1997-99 BDM programs. This chemical is one of the most extensively researched and evaluated pesticides ever developed. More than 30 years of studies have demonstrated the safety and efficacy of this compound. DRC-1339 was discussed in detail in Subsection 5.1.3.1 and Appendix B of the EA. DRC-1339 projects continued during the FY 2000-01 programs. During those two years, an annual average of 2,150.5 grams of this chemical was used in all BDM programs in Kentucky. No substantive changes in quantities or usage patterns occurred. No non-WS entities use DRC-1339 in Kentucky. Therefore, no cumulative effects were observed, or are expected, as a result of the use of this chemical in Kentucky BDM programs.

In BDM programs in Kentucky, WS uses Avitrol in small quantities as was discussed in Subsection 5.1.3.1 and Appendix B of the EA. During FY 1997-99 WS used an average of 35.17 grams (1.23 ounces) of technical Avitrol per year. A typical application involves the use of less than .25 grams (.009 ounces) of technical chemical. During FY 2000-01, WS used an average of 30.85 grams (1.09 ounces) of Avitrol per year. Most applications were never in contact with soil, no applications were in contact with surface or ground water, and uneaten baits were recovered and disposed of according to EPA label specifications.

Avitrol is also used occasionally by KDA and by various pest control companies in Kentucky to address damage associated with birds such as domestic feral pigeons, European starlings, and English sparrows. During FY 2000-01, KDA used a total of approximately the same quantity of technical Avitrol in corn bait formulations per year (21.43 grams, or .75 ounces) at all sites in Kentucky as was cited in the EA for FY 1997-99 (K. Hamilton, KDA, Pers. Comm. 2002). None of these applications were distributed as soil-contact applications and uneaten baits were recovered and disposed of according to label specifications.

In the EA, WS reported that the two largest distributors of Avitrol to pest control companies in Kentucky, Oldham Chemical Company and Van Watters and Rogers (now Univar Corporation) reported total sales of 49.998 grams (1.75 ounces) of technical Avitrol in all grain bait formulations distributed to Kentucky during 1999. Both companies were consulted again in 2002 by WS and total quantities distributed to Kentucky during 1999 were again requested. Based on that information, it was determined that the total quantity reported as distributed by them in the EA was misstated. Recalculate quantities for 1999 are reported in this amendment document as 554.68 grams (19.6 ounces) of technical Avitrol mixed in grain baits.

No precise usage data was available for commercial pest control operators regarding use of Avitrol by them in Kentucky during 2000-01, as was also discovered in the EA for previous years. However, Oldham Chemical Company (J. Hilton, Pers. Comm. 2002) and Univar Corporation (M. Corbitt, Pers. Comm. 2002), reported the total sales of 849 grams (30 ounces) of technical Avitrol in all formulations to Kentucky pest control operators in calendar years 2000-01, which was an average of 424.58 grams (15 ounces) per year. This annual average distributed by Oldham Chemical Company and Univar Corporation during these two years was more than 100 grams less than in 1999. Total usage of technical Avitrol by all applicators in Kentucky for all sites, including the WS BDM program, was probably less than 500 grams (17.67 ounces) each year during 2000-2001. Except for the slight decrease of usage implied by distribution data provided by Oldham Chemical Company and Univar Corporation, these data suggest an essentially unchanged trend in the use of Avitrol in the State by non-WS programs.

Avitrol exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997 and EXTOXNET 2000). Because of Avitrol's characteristic of binding to soils it is not expected to be present in surface or ground water as a result of its use on land (EPA 1980). A combination of chemical characteristics and baiting procedure used by WS reduces the likelihood of environmental accumulation of Avitrol as a result of its use in WS BDM programs in Kentucky. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns of the avicide, soil residues are expected to be low (EPA 1980).

Based on continued use patterns, chemical and physical characteristics of pesticides used in Kentucky BDM programs, and factors related to environmental fate of DRC-1339 and Avitrol, no cumulative impacts are expected from the lethal chemical components used in the WS BDM program.

Non-lethal chemicals used in the Kentucky BDM program were discussed in Subsection 4.2.4 and in Appendix B of the EA. Characteristics of these chemicals and use patterns by those who employ them in Kentucky did not change substantially from those outlined in the EA. Thus, no significant cumulative impacts related to environmental fate are expected from their use in BDM programs in the State.

Another potential cumulative impact related to the use of chemical methods in the current Kentucky BDM program is the potential for such techniques to have adverse effects on populations of target or non-target species, including T&E species. Aspects of the Kentucky BDM program methods and a discussion of trends in potentially affected bird populations are presented in detail in Subsections 5.1.1 and 5.1.2 of the EA. As discussed, program activities had no observable cumulative effects on bird populations in the state for those years analyzed. Trends indicated that bird populations of potentially affected species had either increased, remained stable, or decreased slightly for Kentucky and the Eastern BBS region. None of these factors exhibited substantive change during FY 2000-01. Thus no cumulative effects were observed, or are expected, from the continued use of chemical methods by WS in BDM programs in Kentucky.

6.2 CUMULATIVE IMPACT POTENTIAL FROM NON-CHEMICAL COMPONENTS OF THE FY 2000 - 01 PROGRAMS

Non-chemical methods of the WS BDM program in Kentucky may continue to include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and translocation or euthanasia of birds, harassment dispersal of birds or bird flocks, and shooting of some birds, as was analyzed in the EA. Because shooting is one component of the non-chemical WS BDM program in Kentucky, the deposition of lead shot in the environment was a factor considered in the EA.

Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species fed were observed more than one hundred years ago (Sanderson and Belrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, Federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. Regulations regarding this are found in 50CFR20.21. KDFWR addresses the use of lead shot related to waterfowl hunting in 301 KAR 2:222E Waterfowl Hunting Requirements. Language

used by 301KAR 2:222E states that "a waterfowl hunter shall not use or carry a shotgun shell: (2) containing shot: (a) made of lead (b) not approved by the U. S. Fish and Wildlife Service for waterfowl hunting...." Comparable language in 50CFR20.21 directs hunters that: "While possessing shot (either in shotshells or as loose shot for muzzleloading) other than steel shot, or bismuth-tin (97 parts bismuth: 3 parts tin with 1 percent residual lead) shot, or tungsten-iron (40 parts tungsten: 60 parts iron with 1 percent residual lead) shot, or tungsten-polymer (95.5 parts tungsten: 4.5 parts Nylon 6 or 11 with 1 percent residual lead) shot, or tungsten matrix (95.5 parts tungsten: 4.1 parts polymer with 1 percent residual lead) shot or such shot approved as nontoxic by the Director pursuant to procedures set forth in 20.134, provided that: (1) This restriction applies only to the taking of Anatidae (ducks, geese [including brant] and swans), coots (*Fulica americana*) and any species that make up aggregate bag limits during concurrent seasons with the former in areas described in Sec. 20.108 as nontoxic shot zones...." Nontoxic shot zones are defined in 50CFR20.108 in the following citation: "Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. 'Certain other species' refers to those species, other than waterfowl or coots, that are affected by reason of being included in aggregate bags and concurrent seasons."

All WS BDM shooting activities conform to Federal, State and Local laws. In some programs, WS sometimes finds it necessary to shoot waterfowl under existing permits granted by USFWS (See Subsection 1.7.2.3), usually in airport wildlife hazard management programs where ducks or geese near aircraft operations jeopardize air passenger safety. If such activities are conducted near or over water, WS uses steel shot during activities. Consequently, no deposition of lead in nontoxic shot zones occurs as a result of WS BDM actions in Kentucky.

Use patterns associated with shooting activities remained the same during FY 2000-01, as analyzed in the EA. Therefore, no cumulative impacts are expected related to toxic shot and shooting as a method in the Kentucky WS BDM program. In addition, WS will evaluate other BDM actions which entail the use of shot on a case by case basis to determine if deposition of lead shot poses any risk to non-target animals, such as domestic livestock, in scenarios such as that discussed in Subsection 2.3.2 of the EA. If such risk exists, WS will use nontoxic shot in those situations.

Some potential exists for cumulative impacts to human health and safety related to harassment of roosting bird flocks such as American crows, blackbirds, and European starlings in urban environments. If birds are dispersed from one site and relocate in another where human exposure to concentrations of bird droppings over time occurs, human health and safety threats can occur. This aspect of harassment dispersal programs was discussed in Subsection 1.3.2 of the EA. However, WS uses IWDM strategies to address such bird damage in Kentucky. Such strategies may result in the implementation of either or both of the following: habitat modifications to problem areas or population reductions of American crow, blackbird and European starling numbers which are causing human health and safety impacts. The potential for harassment/dispersal and subsequent relocation of flocks of birds to produce cumulative impacts as a result of their presence in areas of human use is therefore reduced or eliminated by the overall WS BDM strategy.

Application and frequency of use of harassment dispersal programs for nuisance birds in the Kentucky BDM program remained essentially unchanged during FY 2000-01 from that outlined in the EA. Neither has any known increase of activities employing these techniques by non-WS entities occurred during the same time period in Kentucky. Additionally, no substantive changes in effects on human health and safety occurred as a result of these programs. Consequently, no cumulative impacts are expected from the use of harassment or other dispersal methods which might relocate flocks of roosting American crows, blackbirds, European starlings or other species to other human-occupied sites.

No substantive changes in program activities in relation to non-target species of wildlife, including threatened and endangered species occurred during FY 2000-01. No additive effects, as they might relate to non-target species as a result of the use of similar methods being used by non-WS entities, have been noted for the time period.

Therefore, no cumulative impacts affecting target or non-target species of wildlife, including threatened and endangered species, were observed during those 2 years, or are expected, as a result of this alternative.

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10.0 APPENDIX A

BIRDS KILLED BY WS THROUGH ALL METHODS, AND EGGS DESTROYED, IN KENTUCKY, FOR BIRD DAMAGE MANAGEMENT IN FISCAL YEARS 97, 98, 99.

Table 5-1. Birds Killed By WS Through All Methods, And Eggs Destroyed, In Kentucky For Bird Damage Management In FY 97, 98, 99.

FY	Species	Damage Management Methods										
		Alpha Chlor a-lose[1]	DRC-1339	Avitrol	Raptor Trap	Cage Trap	Shooting	Harass-ment / Shooting	Corral	Mist Net	Hand Caught	Eggs Destroyed
1997	Mourning Dove					9	176	490			78	
	Dab. Ducks							4				
	Feral Ducks								10			
	Canada Geese						7	6				
	Feral Geese								55			
	Common Grackles					4	6					
	RgB Gulls						6					
	Other Hawk						1					
	Red-tailed Hawks				1		15	1				
	A. Kestrels				5		27	7				
	Killdeer						51	83			8	
	Horned Larks							2B				
	Mallards						15	19				
	E. Meadowlarks						5	4				
	Feral Pigeons		2,004			185	704				78	
	A. Robin							1				
	Other Shorebirds						6					
	H/E Sparrows			30				54				
	E. Starlings		214,539	2			360	334			20	
	Turkey Vultures						12	11				

FY	Species	Damage Management Methods										
1998	Mixed-species Blackbird		30									
	Red-winged Blackbirds						15	21				
	BH Cowbirds							126				
	A. Crows		200				7	5				
	M. Dove					15	131	496				
	Dab. Ducks							2				
	Feral Ducks	5							10		6	
	Canada Geese						9	46				
	Feral Geese	15							55		2	
	Red-shouldered Hawks						1					
	Red-tailed Hawks				1		27	8				
	A. Kestrels				6		15	4				
	Killdeer						60	211			8	
	Horned Larks							2				
	Mallards						20	24				
	Mallards	7A										
	E. Meadowlarks						2	10				
	Feral Pigeons		3,501			423	1257	704			2	
	A. Robins							6				
	H/E. Sparrows						73			3		
	E. Starlings		61,184				423	754			8	
	Black Vultures							6				
	Mixed Vultures							23				
	Turkey Vultures							14				

FY	Species	Damage Management Methods										
1999	Mixed-species Blackbirds		1,025			5						
	Red-winged Blackbirds		1,322				33	13				
	BH Cowbirds						3	25				
	A. Crows		10B				2	3				
	Mourning Doves						116	308				
	Dab. Ducks							4				
	Diving Ducks						1					
	House Finch						1					
	Canada Geese	1					4	15				
	RgB Gulls							26				
	Great Blue Heron						1					
	Other Hawk						1					
	Red-tailed Hawks				2		23	4				
	A. Kestrels				47		11	6				
	Killdeer						40	62				
	Horned Larks						6	15				
	Mallards						14	44				
	E. Meadowlarks				21		7	18				
	Other Owl							1				
	Feral Pigeons		4,182			1,696	1,602	409			3	
	H/E Sparrows			275				184		1		
	E. Starlings		24,000	100			436	869				
	E. Starlings			20C								
	Mixed Vultures							16				
TOTAL BIRDS KILLED BY METHOD (DURING 3 CONCURRENT FISCAL YEARS)		21	311,997	427	83	2,124	5,732	5,500	130	4	213	

A Birds reported as killed were due to accidental mortalities or euthanasia because of injury, or associated with live-capture by alpha-chloralose.

B Other Unintentional Take

C Non-target Take